

condyles is relatively wider than in the Camel, and the process above the inner condyle is more angular; in both these respects the *Macrauchenia* inclines towards the *Palæothere*.

In the structure of the bones of the leg of the *Macrauchenia* we find the same transitional character which is afforded by the definable limits of the ankylosed bones of the fore-arm. In the *Pachyderma* the fibula is an entire and distinct bone. In the *Ruminantia*, with the exception of the small Musk-deer, and, in an inferior degree, the Elk, the fibula appears only as a short continuous process sent down from the under part of the external condyle of the tibia. In the Camel tribe the only trace of the fibula in the bones of the leg, is this process in a still more rudimental state. In the *Macrauchenia* the fibula is entire, but is confluent with the tibia through nearly its whole extent: the proximal part of the fibula is well defined; its head is ankylosed to the outer condyle of the tibia, but the shaft is continued free for the extent of nearly two inches, and then again becomes confluent with the tibia, forming apparently the outer ridge of that bone. About five inches from the distal end of the tibia this outer ridge becomes flattened by being, as it were, pressed against the tibia, and the anterior and posterior edges are raised above the level of the tibia; beyond this part the limits of the fibula begin again to be defined by deep vascular grooves. The outer side of the distal end of the fibula is excavated by a broad tendinous groove. The fibula and tibia are distinct bones in both the *Palæothere* and *Anoplothere*, as in the *Pachyderms*. It is to the former genus, however, especially *Pal. magnum*, that the *Macrauchenia* presents the nearest approach in the general form of the tibia, the principal bone of its leg: but in the *Macrauchenia* the tibia is relatively shorter, and thicker, and is straighter and less expanded at its extremities, especially the upper one, than in any of the *Palæotheres*.

The mesial boundaries of the two superior articulating surfaces of the tibia are raised in the form of ridges, which are separated by a deep groove; of these ridges the external is the highest, as in *Pal. magnum*: but the articular surfaces in the *Macrauchenia* slope away from these ridges more than in the *Palæotheres*. The rotular or anterior tuberosity of the tibia is more produced, and rises higher than in the *Palæotheres*; the ridge continued downwards from this process is more marked in the *Macrauchenia*, and its limits are better defined: the shaft of the tibia below the ridge is also more flattened in the antero-posterior direction than in the *Palæothere*. The configuration of the back part of both proximal and distal extremities of the tibia are so clearly and accurately given in figures 2 and 3, Pl. XIII., as to render verbal description unnecessary. Neither the text nor the figures in the 'Ossemens Fossiles' afford the means of pursuing the comparison between the *Macrauchenia* and *Palæothere* in these particulars; and I proceed,

therefore, to the consideration of the inferior articulating surface of the bones of the leg (fig. 4, Pl. XIII.)

Since, of the hind foot, we possess in the present collection only a single tarsal and metatarsal bone, the structure of the distal articular surface of the tibia is attended with peculiar interest, because we are taught by Cuvier that it reveals to us in the Ungulate animals the didactyle or tridactyle structure of the foot. In the *Ruminants* this articular surface is nearly square, and extended transversely between two perpendicular malleoli, while in the *Pachyderms* with three toes to the hind-foot the articular surface of the tibia is oblique, and is divided into two facets between the perpendicular malleolar boundaries. Now in the *Macrauchenia*, although the two bones of the leg are ankylosed together, the extent of that part of the tarsal articular surface which is due to the tibia is indicated, as in the case of the radius in the joint of the fore-arm, by a groove; and we are thus able to compare this surface with the distal articular surface of the tibia in the *Palæothere* and *Anoplothere*. It presents in the *Macrauchenia* a very close resemblance with that of the *Palæotherium magnum*,* being divided into two facets by a convex rising, which traverses the joint from behind forwards; but the ridge is narrower, the internal facet somewhat deeper, and the external oblique surface rather flatter than in the three-toed *Palæothere*. In the portion of the tarsal articular surface due to the fibula, we find, however, a more marked deviation from the *Palæothere*, and an interesting correspondence with the *Anoplothere*, in the inferior truncation and horizontal articular surface which is continued upon the lower extremity of the fibula, at right angles with the vertical malleolar facet which forms the outer boundary of the trochlea of the astragalus: this articular surface unerringly indicates a corresponding articular projection in the calcaneum, which, therefore, although the bone itself does not form part of the present collection, we may conclude to differ from the calcaneum of the *Palæotherium*, and to resemble that of the *Anoplotherium*, in this particular at least.

The valuable indication which the distal articular surfaces of the ankylosed tibia and fibula have given of the correspondence of the hind-foot with the fore-foot of the *Macrauchenia*, in regard to the number of the toes, receives ample confirmation from the astragalus, which, of all the bones in the foot, is the one that an anatomist would have chosen, had his choice been so limited, and which most fortunately has been secured by Mr. Darwin, in a very perfect state, in the present instance. I have compared this astragalus with that of the Giraffe, and other *Ruminants*, the Camel, the *Anoplothere*, the Horse, the Hog, the Hippopotamus, Rhinoceros, Tapir, and *Palæothere*: it is with the *Pachyderms* having three toes to the hind-foot, that the *Macrauchenia* agrees in the main distinguishing

* See Ossem. Foss. iii. Pl. XXVI. fig. 5.